

**Supplemental Amendment And  
Submission Of Declaration Under Rule 132  
Appln No.: 09/042,666**

**REMARKS**

Further responsive to the Office Action of September 5, 2001, Applicants herewith submit for consideration additional claims of varying scope together with the Rule 132 Declaration of Professor Martin Fejer of Stanford University. These items will be discussed in turn below.

First, concerning the newly added claims, claims 31-33 added herewith are similar to the claims presently under examination in that they each require a waveguide-form device capable of wavelength conversion using OPG as the conversion mechanism. This combination is believed to be patentable over the art of record for the reasons set forth in previous responses, most particularly those of March 5 and March 8, 2002. The Examiner will note that the new claims differ from those under examination in that they do not necessarily require ultrashort pulse inputs. Further, claim 32 is specific to a single laser as the optical source, which has not and cannot be achieved according to the prior art for reasons of record. Claim 33 differs somewhat in scope from earlier claims in that it is focused on the waveguide device itself. Otherwise, as noted above, it contains the same combination of limitations believed to be of patentable import.

Claim 36 is submitted in order to focus specifically upon one of the key advantages of the invention, that being the surprising degree to which the OPG threshold is reduced according to the invention, as compared with bulk non-linear optical media. A lowering by at least one order of magnitude (factor of 10) is specifically claimed, in order to put the advantage into quantitative form.

Also submitted herewith is a Declaration of Professor Martin Fejer, submitted under Rule 132. Professor Fejer is a named inventor on both the present application and the Arbore patent which is the primary reference employed by the Examiner to date. The purpose of the Declaration is to point out, by an expert statement, the fundamental distinction between the subject matter of the Arbore patent and that of the present application. As Professor Fejer has no direct interest in either the Arbore patent or the present application, this declaration should be accorded substantial weight. It is well known in the field that Professor Fejer is one of this country's preeminent experts in the field of non-linear optical materials and guided wave optics.

**Supplemental Amendment And  
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In view of the above, taken with Applicants earlier responses of March 5 and March 8, 2002 in particular, it is believed to have been proven that the presently claimed invention does not follow from and is by no means obvious in view of the prior art of record, and moreover achieves a surprising and unexpected result in the form of the parametric threshold-lowering effect. Accordingly, it is believed that the presently constituted claims are entitled to patentability, and prompt and favorable review thereof is therefore solicited.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Applicants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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**APPENDIX**  
**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

**Claims 31-36 are added as new claims.**

31. An optical wavelength conversion apparatus, comprising:  
an optical pulse source generating optical pulses; and  
a wavelength conversion channel for converting a wavelength of said optical pulses to a different wavelength, comprising an optical waveguide including an optical parametric generation portion for parametrically generating said optical pulses at said different wavelength.
32. An optical wavelength conversion apparatus, comprising:  
A single laser source for generating optical pulses; and  
a wavelength conversion channel for converting a wavelength of said optical pulses to a different wavelength, comprising an optical waveguide including an optical parametric generation portion for parametrically generating said optical pulses at said different wavelength.
33. An optical wavelength conversion waveguide device, comprising:  
an input end for receiving an optical signal at a first wavelength;  
an optical parametric generator portion for parametrically generating an optical output at a second wavelength differing from said first wavelength,  
at least said optical parametric generator portion being comprised of a nonlinear medium.
34. An optical wavelength conversion waveguide device as claimed in claim 33, further including a mode converter for coupling said optical signal into said input end.
35. An optical wavelength conversion waveguide device as claimed in claim 34, wherein said mode converter comprises a second harmonic generator.

**Supplemental Amendment And  
Submission Of Declaration Under Rule 132  
Appln No.: 09/042,666**

36. An optical wavelength conversion waveguide device as claimed in claim 33, wherein the waveguide device lowers the OPG threshold by at least one order of magnitude as compared to a non-waveguide-form bulk device.



**Declaration of Martin M. Fejer**

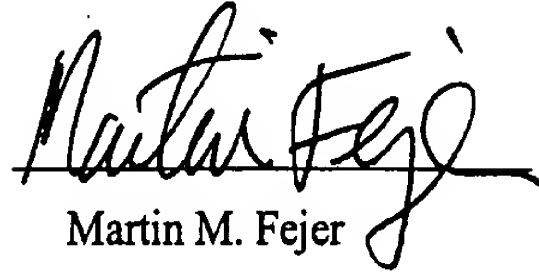
I, Martin M. Fejer, being duly sworn, do hereby state and declare as follows:

1. I currently hold the position of Professor of Applied Physics at Stanford University, where my research is concentrated in, e.g., nonlinear optical materials and devices, guided wave optics and microstructured ferroelectrics.
2. I am a named inventor of subject application 09/042,666, entitled "ULTRASHORT-PULSE SOURCE WITH CONTROLLABLE WAVELENGTH OUTPUT"
3. I am also a named inventor of USP 5,815,307 (Arbore et al.), which the examiner chiefly relies upon in rejecting the claims of the subject application.
4. The '507 patent concerns methods of frequency conversion of ultrashort pulses, typically applied in the context of a chirp-adjusted second harmonic generator realized through the use of a QPM grating having an aperiodic pattern of ferroelectric poling.
5. The subject application concerns the use of wavelength conversion devices which use an optical parametric generator provided in waveguide form to obtain a lowered threshold for parametric interaction, accessible by, for example, low-power ultrafast pulse lasers.
6. Thus, the subject matter of the '507 patent and that of the subject application are quite distinct from one another. The '507 patent does not speak at all to the use of optical parametric generation within a waveguide-type device, or the benefits that stem therefrom in terms of the large reduction in the threshold for parametric interaction that can be achieved. Indeed, this advantage makes it possible to create whole new classes of devices using known low-power sources such as fiber amplifiers and solid state lasers, for example.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the

*considered  
JMF*

United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

A handwritten signature in cursive script, appearing to read "Martin Fejer", written in black ink.

Martin M. Fejer

April 29, 2002